

University of Groningen

The Macroeconomic Toll of Genocide and the Sources of Economic Development

Soudis, Dimitrios; Maseland, Robbert; Inklaar, Robert

Published in:
Economic Aspects of Genocides, Other Mass Atrocities, and their Prevention

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2016

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Soudis, D., Maseland, R., & Inklaar, R. (2016). The Macroeconomic Toll of Genocide and the Sources of Economic Development. In C. H. Anderton, & J. Brauer (Eds.), *Economic Aspects of Genocides, Other Mass Atrocities, and their Prevention* (pp. 125-139). Oxford University Press.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

The Macroeconomic Toll of Genocide and the Sources of Economic Development

DIMITRIOS SOUDIS, ROBERT INKLAAR, AND ROBBERT MASELAND

5.1. Introduction

The costs of conflict and mass killings are not limited to the immediate victims of the violence. Episodes of violent conflict also have severe consequences for the survivors, part of which is in lost economic output. In the short term, civil conflict is bad for the economic growth of afflicted countries (Collier 1999; Koubi 2005), and these negative effects can spill over to contingent states (De Groot 2010). After peace, some of the immediate negative effects of conflict disappear and countries may find themselves in a recovery process, with higher than normal growth rates (Organski and Kugler 1977; Abadie and Gardeazabal 2003; Koubi 2005). Others, though, have questioned whether economic activity recovers from its initial fall (Mueller 2012). Conflict may cause permanent damage to a country's social or physical infrastructure, so that it continues to experience adverse consequences long after the termination of the conflict itself (Ghobarah, Huth, and Russett 2003; Hoeffler and Reynal-Querol 2003).

Genocides have received much less attention than other types of conflict. They are generally treated as separate events in the literature (Sambanis 2004) or even as mere consequences of civil wars (Krain 1997; Stewart 2011). Yet, there is ample reason to expect the economic consequences of genocides to be worthy of independent analysis. First, genocides are characterized by a higher intensity of violence that is more explicitly directed at the civilian population and its livelihood. This results in a relatively higher loss of lives and thus of human capital, but a possibly lower degree of destruction of physical capital. Since a loss of physical capital is easier to restore than losses in human capital, genocides are likely to have more persistent negative effects and may generate less swift recoveries than nongenocidal conflicts. Second, genocides may have different economic effects through their impact on trust and the formal and informal institutions

underlying cooperation. Genocides are likely to be more divisive and tear up the social fabric of society more completely than other forms of violent conflict. Ethnic and communal violence may increase the degree of trust within the in-group, at the expense of trust in out-groups. The resulting damage to social infrastructure increases transaction costs, reducing the scope for impersonal exchange and worsening allocative efficiency (Wallis 2011).

Given the differences between genocides and other forms of conflict, there is good reason to investigate genocides more systematically. This chapter does so by providing a broad, cross-country empirical investigation. Thus, we aim to answer the question of how genocides and mass political killings (henceforth both events will be referred to as “genocides”) affect economic outcomes. Extant genocide literature mainly uses economic variables to predict or explain the occurrence of genocide, although empirical support for this relationship is weak at best (Stewart 2011). There is not much work on the opposite relation: Do genocides affect economic outcomes and, if so, how? What is more, the few studies that have addressed this question focus on the Rwandan case, which might not be representative of genocides in general. At the macro level, Lopez and Wodon (2005) argue that Rwanda’s per capita gross domestic product (GDP) levels would have been 25 to 30 percent higher had the genocide of 1994 not happened. On the individual level, Serneels and Verpoorten (2013) argue that, six years after the Rwandan genocide, households that experienced more violence are lagging behind in terms of consumption. However, Rogall and Yanagizawa-Drott (2013) find the exact opposite result. The conflicting and country-specific evidence suggests there is a clear need for more systematic analysis.

We provide such an analysis by combining data from the newly released version 8.0 of the Penn World Table (PWT; see Feenstra, Inklaar, and Timmer 2015) and the Political Instability Task Force (Marshall, Gurr, and Harff 2014) data on genocides and politicides, creating a dataset covering thirty-five episodes of genocide in twenty-three countries. Our two goals are, first, to distinguish between the short-term and long-term effects of genocides on economic outcomes; and, second, to determine whether any negative effects on GDP can be traced to decreases in capital or decreases in productivity.

Given the broader literature on the effects of conflicts on economies, it could be that (1) genocides have only a transitory negative effect on economic activity, as a short-term decline is compensated by a longer-term recovery; (2) genocides have a permanent adverse effect on the level of economic activity, and while growth subsequently resumes on its old path, it thereby does *not* catch up to its pregenocide trend level; or (3) genocide leads to a permanently lower growth path. To distinguish among these three scenarios, we follow the methodology of Cerra and Saxena (2008) and estimate an autoregressive (AR) model for economic outcomes and a variable indicating when genocide starts. Using impulse response functions (IRFs), we show that economic activity follows scenario (2): It

declines sharply at the start of a genocide and does not subsequently recover this lost ground—a result in line with the findings for civil wars in Mueller (2012).

Furthermore, we find that the reduction in GDP per worker can be traced to a decline in productivity, not to a decline in physical capital per worker. This leads us to conclude that the start of genocide results in a significant disruption of the economic process in the afflicted countries—leading to a permanent drop in the level of productivity compared to a scenario without genocide—but not a long-run destruction of growth potential. We note, though, that this is not a statement of causality as we cannot rule out that genocide has its roots (partly) in economic circumstances.

5.2. How Genocides May Effect Economic Outcomes

Apart from their costs in terms of human suffering, genocides are likely to bring about serious economic costs. A broad literature has documented the economic effects of civil wars and conflicts, showing that civil conflict does considerable contemporary harm to the economy (Collier 1999; Abadie and Gardeazabal 2003; Hoeffler and Reynal-Querol 2003; Koubi 2005; Lopez and Wodon 2005; De Groot 2010; Serneels and Verpoorten 2013). Collier (1999) identifies three main channels through which civil conflict may affect economic growth. First, civil war may directly destroy capital, cause capital flight, and reduce savings, eroding a country's capital stock. Second, militarization and increased security expenses imply that resources are diverted from productive activities toward nonproductive activities, resulting in a lower factor of productivity. Third, higher transaction and transport costs due to disruption of social and physical infrastructure and the undermining of the state may result in a less efficient allocation of productive factors (Collier 1999).

To formalize how these channels may be distinguished (in part), it is helpful to consider a growth-accounting decomposition. This decomposition is originally attributed to Solow (1957) (see Hulten [2010] for a comprehensive and modern survey). Assume that the output of an economy, Y , is produced using capital, K , labor, L , and with productivity level, A , in a Cobb-Douglas production function:

$$Y = AK^a L^{1-a}. \quad (1)$$

The output of an economy is its level of GDP, the capital stock consists of cumulated past investments in buildings and machinery, labor is the number of workers in the economy, a is the output elasticity of capital, and productivity is the efficiency with which capital and labor are combined into output. This concept

of productivity is usually referred to as total factor productivity (TFP). Equation (1) can be expressed in terms of growth rates of output per worker $y \equiv Y/L$ as:

$$\Delta \log y = \alpha \Delta \log k + \Delta \log A, \quad (2)$$

where $k \equiv K/L$. This implies that the growth of GDP per worker, $\Delta \log y$, on the left-hand side of equation (2) can be expressed as the contribution from changes in the capital stock per worker plus TFP growth on the right-hand side. In the original work by Solow (1957), TFP growth was given the interpretation of technological change, but this interpretation relies on strict assumptions such as perfect competition. More generally, TFP growth is computed as a residual; and Hulten (2010) discusses that TFP growth can reflect much more, including the efficiency of resource allocation (see also Fernald and Neiman [2011] more specifically on this point). Indeed, the fact that TFP is measured as a *residual* means that we can empirically distinguish only the effect of genocide on the capital/labor ratio (k) from the effect on all other factors influencing economic activity.

Seen through this lens, all three channels identified by Collier (1999) imply that economic activity is negatively affected by conflict; but in the case of direct destruction (the first channel), this is because the input of capital is reduced. In the case of the other two channels—militarization and security spending, and transaction and transport costs—the effect would be seen in the country's productivity. The shift toward military activities and/or higher transaction costs and social, institutional, and physical disruption would lead to a less efficient use of a given set of inputs, and so result in a reduction in TFP, the second component on the right-hand side of equation (2).

Leaving aside the precise channels, it seems safe to conclude that there is a net negative contemporaneous effect of civil conflict on the economy. However, the longer-term effects are more hotly debated (Cerra and Saxena 2008; Chen, Loayza, and Reynal-Querol 2008; Voors et al. 2012). Collier (1999) maintains that the main harm done through capital flight and dissaving is reversible once peace is restored. In his argument, agents respond to the fall in productivity from disruption during a conflict by moving capital out of the country. When the conflict's immediate negative effect on productivity is lifted, the resulting lack of capital in postconflict economies makes returns on investment relatively high. A recovery phase may set in, with temporarily higher growth rates. The occurrence of such a recovery phase depends on the duration of the conflict, however. If a conflict constitutes a short, negative shock to the economy, the economy has not yet completely adjusted to the conflict-time equilibrium when peace is restored. If the war is long, there is a higher chance of seeing a recovery, as all negative adjustments have been made and the economy can begin anew. Studying the effects of the long-running conflict in the Basque region of Spain, Abadie and Gardeazabal (2003) indeed find empirical support for a recovery after a truce is called.

Others have argued that conflicts continue to do harm long after the fighting has stopped, in terms of both casualties and economic costs (Ghobarah, Huth, and Russett 2003; Hoeffler and Reynal-Querol 2003). Part of the reason is that while the destruction and diversion of capital associated with violent conflict may have ended, the damage done to a country's social infrastructure and to the legitimacy and effectiveness of the state may be permanent. The ethnic nature of violence in genocides is especially likely to do lasting harm to social ties, trust, and institutions (Rohner, Thoenig, and Zilibotti 2013; Bauer et al. 2014). This matters because the decline in institutions that facilitate interactions between individuals and groups in the economy erodes the potential for cooperation, exchange, and specialization, with adverse economic consequences (North 1990; Putnam 1993; Easterly 2001; Wallis 2011). Indeed, a recurrent result in the empirical growth literature is that past shocks to institutional quality often have enduring effects on future economic performance (Guiso, Sapienza, and Zingales 2008; Nunn 2009; Spolaore and Wacziarg 2013). There is also increasing evidence that violent conflict may change the preferences of individuals, inducing them to become more risk-seeking and developing higher discount rates, thus pushing down savings rates permanently (Voors et al. 2012; Bauer et al. 2014; Callen et al. 2014). For these reasons, the economic damage done by conflict may not be easily restored. If the erosion of institutions and social capital affects the potential for adaptation and innovation, it may even set economies on a permanently lowered growth path.

Genocidal conflicts may be particularly prone to have such long-term effects. Aimed less at harming an opponent's fighting capacity and more at eliminating entire segments of the civilian population, the effects of genocides on physical capital may be relatively limited compared to regular violent conflict, while the costs in terms of human capital are relatively high (Serneels and Verpoorten 2013). As a consequence, genocides may have more persistent income effects. The ethnic or communal component of most genocides is also likely to do particular harm to societal institutions and social capital. For these reasons, we expect genocides to have stronger long-term effects on productivity and output.

On the basis of the arguments discussed here, we identify three possible scenarios for growth after genocide (see Figure 5.1). The first is a recovery scenario (left-hand panel), wherein the decline in productivity and output occurring during genocide is only temporary, and societies bounce back to the previous growth trajectory after peace is restored. In this scenario, genocides have the same effects as mild civil conflicts, causing contemporary diversion and destruction during the conflict itself but doing no permanent damage to the economy.

The second scenario (middle panel) is that of a onetime permanent drop in productivity levels, with no changes in subsequent growth rates but without ever catching up to the prior trend line of economic growth. This may be due to lasting damage to institutions and social capital, causing a reduction in allocative efficiency.

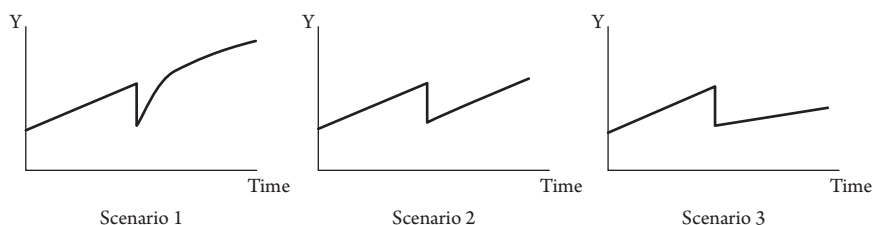


Figure 5.1 Growth after genocide—possible scenarios.

Scenario three (right-hand panel) is the one in which genocides set societies on a permanently lower growth path. Adverse effects of genocides on savings rates, innovation, and adaptive efficiency of a society's institutions may cause such long-term effects. The aim of our empirical analysis is to determine which of these scenarios best fits the economic experience of countries that have experienced genocide.

5.3. Data and Methods

To quantify the effect of genocide on economic performance, we combine three datasets. Our economic variables come from the PWT, version 8.0, covering 167 countries between 1950 and 2011 (Feenstra, Inklaar, and Timmer 2015). We calculate the annual growth rate of GDP per worker for each country and decompose it into the growth of physical capital per worker, plus the growth in TFP, using the growth accounting decomposition on the right-hand side of equation (2). The PWT also provides its own growth accounting decomposition (see Feenstra, Inklaar, and Timmer 2015), but coverage of countries is incomplete due to missing data on human capital and capital income shares. We therefore use the average capital share as our estimate of α , used to weight the growth of (physical) capital per worker and construct TFP growth as a residual. We use all three indicators as dependent variables in order to identify the channel through which genocides affect growth.

While these three indicators provide a more detailed view of the economic consequences of genocide, they are not without limitations. In general, data collected in a turbulent period may be subject to greater measurement error, although without a bias in a specific direction this will only make it harder to draw any type of statistically valid conclusion. It could be that demographic information, and thus data on the number of workers that we use to scale GDP and capital, is particularly less reliable around genocide (on the demography of genocide, see chapter 4 in this volume). We will thus also estimate a model with GDP growth as the dependent variable.

A final remark on the growth data concerns the data on capital. The capital data from the PWT are based on accumulated and depreciated past investment, which means that direct destruction of capital is not measured. The impact of such destruction will be apparent in TFP growth, since that is measured as a residual. However, destruction of capital would, *ceteris paribus*, raise the marginal productivity of new investments and stimulate faster growth in capital in the future. This would show up as a delayed *positive* effect of genocide on capital per worker growth and would, in principle, be captured by our analysis.

Our genocide indicator comes from the Genocide and Politicide Problem Set produced by the Political Instability Task Force (PITF). The PITF provides annual information on genocides and politicides for all countries with a total population of 500,000 or greater, covering the period from 1955 to 2011. (On genocide and mass atrocity data generally, see chapter 3 in this volume.) Genocides in our study “involve the promotion, execution, and/or implied consent of sustained policies by governing elites or their agents or in the case of civil war, either of the contending authorities that result in the deaths of a substantial portion of a communal group or politicized non-communal group” (Marshall, Gurr, and Harff 2014, 14). The victimized groups are defined both in terms of their communal (ethnolinguistic, religious) characteristics (in the case of genocides) as well as their political opposition to the regime and dominant groups (for politicides). The PITF dataset covers 35 episodes of genocide across 23 countries with a median length of 5.5 years.

Our estimation is based on the approach used by Cerra and Saxena (2008). We use an autoregressive distributed lag model to estimate the effects of genocide on our three dependent variables and subsequently construct IRFs to represent these effects graphically. In particular we estimate:

$$z_{it} = \beta_i + \sum_j \beta_j z_{i,t-j} + \sum_{s=0}^3 \delta_s G_{i,t-s} + \varepsilon_{it}, \quad (3)$$

where z_{it} is one of the three measures of economic outcomes for country i at time t (i.e., $\Delta \log y_{it}$, $\Delta \log k_{it}$, or $\Delta \log A_{it}$) and G is an indicator coding whether a genocide started in year t in country i . As argued by Mueller (2012), this start-year coding makes it possible to correctly assess the economic impact of a genocide (or other conflict), in contrast with coding all years in an episode as in Cerra and Saxena (2008). Our choice of lag-length is based on the statistical significance of the lagged coefficients of the dependent variables; after the third lag, none of the coefficients reach conventional levels of statistical significance. The IRFs are graphed together with a 95 percent confidence interval based on the results of 1,000 bootstrapped samples.



This empirical strategy is well suited to identify not only the initial effect of genocide but also to trace its dynamic impact on the economy. However, it does

not say anything about causality. We effectively have to assume that genocide starts at a random point in time and then, having started, we can determine how the economy evolves. It could, of course, be the case that genocide has (in part) roots in previous economic developments—although Stewart (2011) finds no clear evidence of this—and in that case our estimates will be biased. Our analysis can thus best be compared with event studies in finance: Given the start of genocide, how does the economy evolve in subsequent years?

5.4. Results

Table 5.1 shows summary statistics for the three growth indicators for our main sample of 23 countries that experienced genocide and, for reference, the statistics for all 167 countries in the PWT. Moreover, the statistics for countries that experienced genocide are split between periods—when there was genocide, and when there was not (see Table 5.3 for the list of genocide countries and periods). In nongenocidal years, genocide countries experience, on average, somewhat higher growth in GDP per worker than the average PWT country—namely, 2.7 percent average annual growth versus 1.9 percent—and correspondingly faster growth in capital per worker (2.6 versus 2.2 percent) and faster TFP growth (1.5 versus 0.9 percent). However, this changes drastically when focusing on the genocide years: growth in GDP per worker is –0.3 percent on average, growth in capital per worker is only 1.9 percent, and TFP growth is –1.2 percent. Note, though, that variation around the average growth rates tends to be higher in genocide countries

Table 5.1 Summary Statistics for Growth

<i>Growth in:</i>	<i>Genocide Countries</i>		<i>All Countries</i>			
	<i>Nongenocidal Period</i>		<i>Genocidal Period</i>			
GDP per worker	0.027	(0.082)	 0.003	(0.088)	0.019	(0.063)
Capital per worker	0.026	(0.062)	–0.019	(0.045)	0.022	(0.043)
Total factor productivity	0.015	(0.073)	 0.012	(0.084)	0.009	(0.058)
No. of observations	861		204		7,026	

Notes: The table shows average growth, with the standard deviation in parentheses. Statistics for “genocide countries” are based on data from PWT (version 8.0) for the 23 countries that experienced genocide since 1955 (see Table 5.3), with genocidal period(s) as shown in Table 5.3. Statistics for “all countries” cover all 167 countries in the PWT.

than in nongenocide countries, and observations for all countries and years are simply lumped together. So while these summary statistics are surely suggestive of sharply lower growth during genocides, a formal analysis is needed to more firmly establish any effect.

We present the results from the estimation of equation (3) in the form of cumulative impulse responses. Figure 5.2 depicts the effect of the start of genocide on the growth of GDP per worker and its constitutive parts. The left panel shows that in the first three years after the start of genocide, GDP per worker declines, on average, by 9.7 percent. This decline is statistically significant, as indicated by the 95 percent confidence interval, although the broad-width confidence interval could indicate that there is considerable variation in the impact of genocides across countries. After the initial decline, there is very little change in the cumulative response function, indicating that the loss in the level of GDP per worker is *not* recovered in subsequent years. This outcome is consistent with Scenario 2 in Figure 5.1, as Scenario 1 would imply a total recovery from the negative shock of genocide; while for Scenario 3, the cumulative effect should continue to decline. This impulse response function (IRF) is estimated based on changes in GDP per worker, to match the concept in the growth accounting framework, but we have also estimated the same model on changes in the level of GDP per se. The resulting IRF matches the IRF for GDP per worker quite closely, as shown in Figure 5.3.

Next, we look at the effects of genocide on the growth of capital per worker and on TFP. Starting with the latter, the IRF for TFP is essentially identical to that for

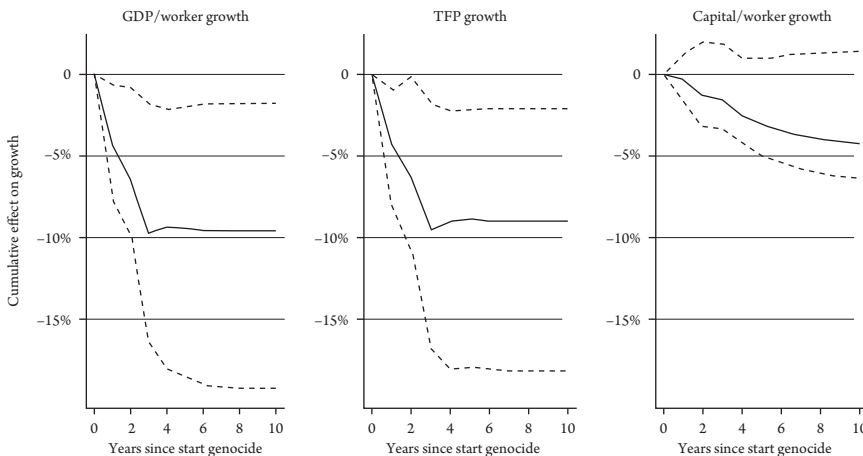


Figure 5.2 The effect of the start of genocide on GDP per worker and its constituent parts. Notes: Impulse response functions (solid lines) represent GDP/worker growth and its constituent parts. The vertical axis shows the cumulative effect on growth, while the horizontal axis indicates the number of years since the start of genocide. Dashed lines show 95 percent confidence intervals.

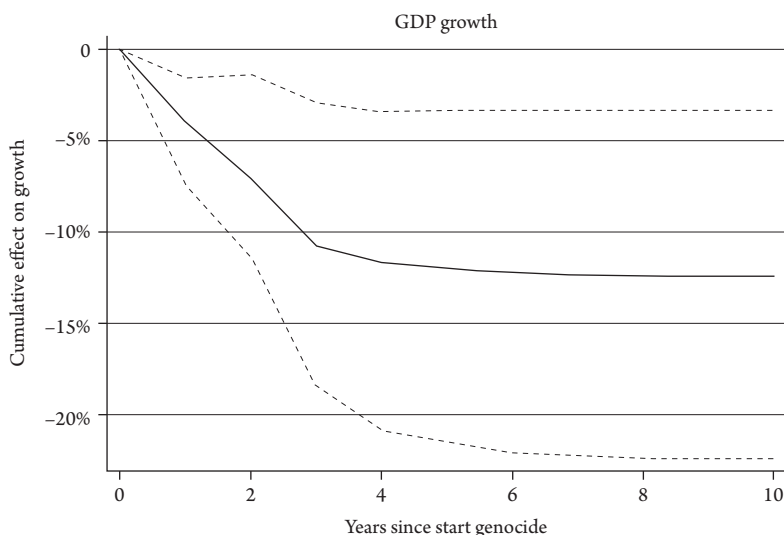


Figure 5.3 The effect of the start of genocide on GDP. Notes: Impulse response functions represent growth in GDP (solid lines). The vertical axis shows the cumulative effect on growth, while the horizontal axis indicates the number of years since the start of genocide. Dashed lines show 95 percent confidence intervals.

GDP per worker, with a negative cumulative effect after three years of 9.5 percent. In contrast, the confidence interval in the IRF for physical capital is on both sides of zero, indicating no statistically significant effect for the start of genocide on capital per worker. As discussed before, our measure of capital is accumulated and depreciated past investment and does not take into account any physical destruction. However, physical destruction would, under normal circumstances, increase the marginal product of capital and thus stimulate investment. As a result, capital would increase with some lag following any physical destruction unless a perfectly countervailing decline in TFP would reduce the marginal product of capital to remove the incentive to invest. So our finding—that there is no effect on capital—suggests that physical destruction alone cannot account for the decline in GDP. If there were significant physical destruction, it would have to be in fine balance with the loss of TFP, since there is no significantly higher or lower investment with a lag.

To check on the robustness of these results and to understand whether variables such as the duration of genocide or its intensity—as measured by the number of deaths as a percentage of the population—have a moderating effect on the severity of the economic impact, we repeat the previous estimation exercises using subsamples of the data. In particular, we calculate the median duration of genocide (in years) and the median magnitude of deaths and estimate IRFs for the group of countries that fall above or below each median. Table 5.2 summarizes

Table 5.2 The Effect of Genocide on Growth of GDP per Worker in the Short Run and Long Run by Genocide Characteristics

	<i>Short Run (Year 1)</i>		<i>Long Run (Year 10)</i>		<i>Leveling off</i>
All Genocides	–0.043	(–0.076, –0.006)	–0.096	(–0.193, –0.018)	Yes
High Casualties	–0.047	(–0.126, –0.033)	–0.134	(–0.293, –0.038)	Yes
Low Casualties	–0.044	(–0.067, –0.021)	–0.067	(–0.159, –0.030)	Yes
Short Duration	–0.045	(–0.102, –0.005)	–0.057	(–0.209, –0.003)	Yes
Long Duration	–0.045	(–0.062, –0.000)	–0.160	(–0.285, –0.044)	Yes

Notes: The table shows the effects of genocide on the growth of GDP per worker at Years 1 and 10 (as well as the 95 percent confidence intervals in parentheses), using the IRF estimates obtained by equation (3) estimated on subsamples, split by the median death toll and by the median duration of a genocide.

the main results for GDP per worker, with the short-run effect in the first year after the start of genocide and the long-run effect ten years after the start of genocide. As the table shows, the short-run effects are all very similar, with a decline in GDP per worker of approximately 4.5 percent. There is more variation in the long-run effects, with the point estimates showing a decline of 13.4 percent for genocides with above-median deaths and a decline of 6.7 percent in genocides with below-median deaths. Likewise, in genocides with duration above the median of 5.5 years, the long-run effect is larger, with a 16 percent decline, than is the negative effect in briefer genocides of 5.7 percent. However, the smaller sample size of genocides in these subsamples means that it is harder to draw statistically significant contrasts between these effects.

Our results should be interpreted with caution since it is empirically not feasible to separate the effects of genocide from civil war. Table 5.3 presents the episodes of genocide in our dataset where, in the last column, we show the number of genocide years that overlapped with a civil war. In our sample there are only two countries (Ethiopia and Cambodia) where the two crises do not overlap. On average, about 60 percent of country-year episodes of genocide overlap with a civil war. Those that do not most often take place before, after, or between recurring episodes of civil war. Controlling for civil war and estimating conditional IRFs does not change the results presented above, but we do not want to claim that this empirical strategy fully disentangles the effects of the two types of conflict.

Table 5.3 Genocidal Episodes and Overlap with Civil Wars

<i>Country</i>	<i>Genocidal Period</i>	<i>Duration</i>	<i>Civil War Overlap (no. of years)</i>
Angola	1975–1994, 1998–2002	25	7
Argentina	1976–1980	5	2
Bosnia and Herzegovina	1992–1995	4	3
Burundi	1965–1973, 1988, 1993	11	1
Cambodia	1975–1979	5	No
Chile	1973–1976	4	1
China	1959, 1966–1975	11	1
Congo (Dem. Republic)	1963, 1965, 1977–1979	5	No data
El Salvador	1980–1989	10	10
Equatorial Guinea	1969–1979	11	1
Ethiopia	1976–1978	4	No
Guatemala	1978–1990	13	13
Indonesia	1965–1966, 1975–1992	20	19
Iran	1981–1992	12	11
Iraq	1964–1975, 1988–1991	17	15
Nigeria	1967–1970	4	4
Pakistan	1971, 1973–1977	6	5
Philippines	1972–1976	5	5
Rwanda	1963–1964, 1994	3	1
Sri Lanka	1989–1990, 2008–2009	15	2
Sudan	1956–1972, 1983–2011	46	No data
Syria	1981–1982	2	2
Uganda	1971–1986	16	9

Source: Data from Political Instability Task Force (Marshall, Gurr, and Harff 2014).

Similarly, it is very difficult to establish through what channel(s) TFP growth is reduced. One prominent potential channel is a decrease in the degree of trust within society or even a broader loss of social capital. However, systematic time-varying data is not available to test this. There is more information about political institutions that might serve as a proxy for their capacity to exchange and work

together with other parts of society. In particular, data on the competitiveness of the political environment—that is, whether executives are openly recruited as opposed to whether there is an elite that rules over the state—may provide relevant information (data from Marshall, Gurr, and Jagers 2014). However, in our sample of twenty-three countries, only five experienced a reduction in political competitiveness at or around the time of genocide. This small sample size prevents us from testing the proposed relationship.

Summing up our results, genocides act as a negative shock to the growth path of afflicted countries through the effects they have on productivity. This has a permanent negative effect on the level of economic activity and productivity; the growth rates do return to their previous path, but at a lower level of GDP than before.

5.5. Concluding Remarks

Genocides are not just atrocious events that exact a great toll of human suffering, but they also have a negative effect on economic activity. We find that in the first three years after the start of genocide, GDP per worker decreases by about 10 percent. In contrast to civil wars, where somewhat smaller effects disappear over the long run, this negative effect of genocide on the economy persists for ten or more years. Some of the initial economic damage of violent conflicts is subsequently restored, but for genocides this apparently is an incomplete process. We present evidence that the income reduction is primarily caused by a reduction in TFP, that is, the efficiency with which production factors are used in the economy. Production factors per se are much less affected, economically speaking. All these results are in line with the interpretation that genocide typically tears social bonds in society and harms social capital in a more pervasive fashion than does civil war, thereby reducing allocative efficiency.

Some caveats are in order. First, although our results fit an erosion of social capital narrative, direct proof that the reduction in TFP growth is attributable to a reduction in social capital cannot be provided because of lack of data. Reliable historical information on trust and social capital is not available. Second, while our analysis focuses on a systematic assessment of the economic effects of genocide in general, we acknowledge that each episode of genocide is a historically unique event. Economic impacts are likely to vary accordingly. The fact that our figure for the economic costs of genocides differs substantially from the reduction of 25 to 30 percent found by Lopez and Wodon (2005) for the Rwandan genocide attests to this. Genocides differ on dimensions such as the number of people affected, their geographic concentration, their duration and intensity, and their political outcome. However, while genocides may not be rare (see chapter 3), there are still too few of them to allow for a systematic analysis of the effect of these differences

on economic outcomes. Third, as indicated, our analysis of the economic damage associated with genocide should not be read as a statement on causality. Although evidence points to the contrary (Stewart 2011), we cannot rule out that genocide has its roots (partly) in economic circumstances. (For literature reviews on economic correlates, causes, and consequences of genocide, see chapters 9, 10, and 24 in this volume.)

These caveats notwithstanding, the results presented in this chapter strongly contribute to the view that genocides carry serious economic consequences that go beyond those of “regular” civil wars. The finding of lasting negative effects makes the avoidance of genocide even more important and suggests that policies after genocide should be firmly focused on restoring some of the broken ties between communities.

References

- Abadie, A., and J. Gardeazabal. 2003. “The Economic Costs of Conflict: A Case Study of the Basque Country.” *American Economic Review* 93, no. 1: 113–32.
- Bauer, M., A. Cassar, J. Chytilová, and J. Henrich. 2014. “War’s Enduring Effects on the Development of Egalitarian Motivations and In-Group Biases.” *Psychological Science* 25, no. 1: 47–57.
- Callen, M., M. Isaqzadeh, J. D. Long, and C. Sprenger. 2014. “Violence and Risk Preference: Experimental Evidence from Afghanistan.” *American Economic Review* 104, no. 1: 123–48.
- Cerra, V., and S. C. Saxena. 2008. “Growth Dynamics: The Myth of Economic Recovery.” *American Economic Review* 98, no. 1: 439–57.
- Chen, S., N. V. Loayza, and M. Reynal-Querol. 2008. “Aftermath of Civil War.” *World Bank Economic Review* 22, no. 1: 63–85.
- Collier, P. 1999. “On the Economic Consequences of Civil War.” *Oxford Economic Papers* 51, no. 1: 168–83.
- De Groot, O. J. 2010. “The Spillover Effects of Conflict on Economic Growth in Neighbouring Countries in Africa.” *Defence and Peace Economics* 21, no. 2: 149–64.
- Easterly, W. 2001. “Can Institutions Resolve Ethnic Conflict?” *Economic Development and Cultural Change* 49, no. 4: 687–706.
- Feenstra, R. C., R. Inklaar, and M. Timmer. 2015. “The Next Generation of the Penn World Table.” *American Economic Review* 105, no. 10: 3150–82.
- Fernald, J., and B. Neiman. 2011. “Growth Accounting with Misallocation: Or, Doing Less with More in Singapore.” *American Economic Journal: Macroeconomics* 3, no. 1: 29–74.
- Ghobarah, H. A., P. Huth, and B. Russett. 2003. “Civil Wars Kill and Maim People—Long after the Shooting Stops.” *American Political Science Review* 97, no. 2: 189–202.
- Guiso, L., P. Sapienza, and L. Zingales. 2008. *Long Term Persistence*. National Bureau of Economic Research (NBER). Working Paper No. 14278. Cambridge, MA: NBER.
- Hoeffler, A., and M. Reynal-Querol. 2003. “Measuring the Costs of Conflict.” Oxford: Centre for the Studies of African Economies. University of Oxford. Oxford: UK. http://conflict-recovery.org/bin/2003_Hoeffler_Reynal-Measuring_the_Costs_of_Conflict.pdf [accessed December 22, 2015].
- Hulten, C. M. 2010. “Growth Accounting.” In B. H. Hall and N. Rosenberg, eds., *Handbook of the Economics of Innovation*. Vol. 2. Amsterdam: Elsevier, 987–1031.

- Inklaar, R., and M. P. Timmer. 2013. *Capital, Labor, and TFP in PWT8.0*. Mimeo. Downloadable from www.ggdc.net/pwt.
- Koubi, V. 2005. "War and Economic Performance." *Journal of Peace Research* 42, no. 1: 67–82.
- Krain, M. 1997. "State-Sponsored Mass Murder: The Onset and Severity of Genocides and Politicides." *Journal of Conflict Resolution* 41, no. 3: 331–60.
- Lopez, H., and Q. Wodon. 2005. "The Economic Impact of Armed Conflict in Rwanda." *Journal of African Economies* 14, no. 4: 586–602.
- Marshall, M. G., T. R. Gurr, and B. Harff. 2014. *PITF–State Failure Problem Set: Internal Wars and Failures of Governance, 1955–2013*. Vienna, VA: Center for Systemic Peace, <http://www.systemicpeace.org/inscr/PITFProbSetCodebook2013.pdf>.
- Marshall, M. G., T. R. Gurr, and K. Jaggers. 2014. *Polity IV Project: Political Regime Characteristics and Transitions, 1800–2013*. Vienna, VA: Center for Systemic Peace, www.systemicpeace.org/polity/polity4.htm.
- Mueller, H. 2012. "Growth Dynamics: The Myth of Economic Recovery: Comment." *American Economic Review* 102, no. 7: 3774–77.
- North, D. C. 1990. *Institutions, Institutional Change and Economic Performance*. New York: Cambridge University Press.
- Nunn, N. 2009. "The Importance of History for Economic Development." *Annual Review of Economics* 1, no. 1: 62–92.
- Organski, A. F. K., and J. Kugler. 1977. "The Costs of Major Wars: The Phoenix Factor." *American Political Science Review* 71, no. 4: 1347–66.
- Putnam, R. D. 1993. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton, NJ: Princeton University Press.
- Rogall, T., and D. Yanagizawa-Drott. 2013. "The Legacy of Political Mass Killings: Evidence from the Rwandan Genocide." http://www.hks.harvard.edu/fs/dyanagi/Research/Legacy_of_Rwandan_Genocide.pdf.
- Rohner, D., M. Thoenig, and F. Zilibotti. 2013. "Seeds of Distrust: Conflict in Uganda." *Journal of Economic Growth* 18, no. 3: 217–52.
- Sambanis, N. 2004. "Using Case Studies to Expand Economic Models of Civil War." *Perspectives on Politics* 2, no. 2: 259–79.
- Serneels, P., and M. Verpoorten. 2013. "The Impact of Armed Conflict on Economic Performance: Evidence from Rwanda." *Journal of Conflict Resolution*. Published online: <http://jcr.sagepub.com/content/early/2013/12/13/0022002713515409.abstract>.
- Solow, R. M. 1957. "Technical Change and the Aggregate Production Function." *Review of Economics and Statistics* 39, no. 3: 312–20.
- Spolaore, E., and R. Wacziarg. 2013. "How Deep Are the Roots of Economic Development?" *Journal of Economic Literature* 51, no. 2: 325–69.
- Stewart, F. 2011. "Economic and Political Causes of Genocidal Violence: A Comparison with Findings on the Causes of Civil War." MICROCON Research Working Paper 46. Brighton, UK: MICROCON.
- Voors, M. J., E. Nillesen, P. Verwimp, E. H. Bulte, R. Lensink, and D. P. Van Soest. 2012. "Violent Conflict and Behavior: A Field Experiment in Burundi." *American Economic Review* 102, no. 2: 941–64.
- Wallis, J. 2011. "Institutions, Organizations, Impersonality and Interests: The Dynamics of Institutions." *Journal of Economic Behavior and Organization* 79, nos. 1–2: 48–64.

